AMENDMENTS TO THE CLAIMS

1. (currently amended) A method of operating a corona discharge device comprising the steps of:

producing a high-intensity electric field in an immediate vicinity of a corona electrode and

heating at least a portion of the corona electrode to a temperature sufficient to mitigate an undesirable effect of an impurity formed on said corona electrode,

wherein said steps of producing a high intensity electric field and heating do not overlap.

2. (currently amended) The method according to claim 1 wherein said portion of said corona electrode comprises a metal readily oxidized in a strong electric field in the presence of oxygen and selected from the group consisting of silver, lead, zinc and cadmium.

3. (currently amended) The method according to claim 1 wherein said portion of said corona electrode is heated to attain a temperature T sufficient for deoxidation of a material forming said corona electrode ~~given by the equation~~

~~$T > \Delta H^{o}_{rxn} / \Delta S^{o}_{rxn}$~~

~~where ΔH^{o}_{rxn} is the standard state enthalpy (Dhorxn) and ΔS^{o}_{rxn} is the standard state entropy changes for the oxidation process of a surface material of said corona electrode~~.

4. (currently amended) The method according to claim 1 wherein said step of producing a high intensity electric field includes applying a high voltage to said corona electrode sufficient to cause a corona discharge from said corona electrode and said step of heating

includes applying a low voltage to said corona electrode, wherein said steps of applying said high voltage and said low voltage do not overlap.

Claims 5 -6: Canceled

7. (currently amended) The method according to claim 1 wherein said step of heating is performed periodically so as to reduce oxidation products of a material of said corona electrode formed during preceding steps of producing said high-intensity electric field.

Claim 8: Canceled

9. (currently amended) The method according to claim 1 wherein said portion of said corona electrode comprises a material that readily oxidizes in an oxygen atmosphere under the influence of said high intensity electric field ~~air and/or the alloy containing such a material~~.

10. (currently amended) The method according to claim 1 wherein said step of ~~periodically~~ heating includes a step of monitoring an electrical resistivity characteristic of said corona electrode and, in response, heating said portion of said corona electrode.

11. (currently amended) The method according to claim ~~10~~ 1 wherein said impurity comprises an oxidized surface layer of a material forming said corona electrode ~~electrical characteristic is an electrical resistivity of said corona electrode or a portion of that electrode~~.

12. (currently amended) The method according to claim 11 wherein said step of producing a high intensity electric field includes applying a high voltage to said corona electrode sufficient to cause a corona discharge from said corona electrode and said step of heating includes apply a low voltage to said corona electrode, wherein said steps of applying said high voltage and said low voltage do not overlap ~~10 wherein said characteristic is an electrical conductivity of said corona electrode or a portion of that electrode~~.

13. (currently amended) The method according to claim 1 wherein said step of ~~periodically~~ heating includes a step of terminating an application of a heating voltage to ~~of~~ said corona electrode in response to detecting a predetermined electrical characteristic of said corona electrode.

14. (original) The method according to claim 13 wherein said electrical characteristic includes a characteristic selected from the group consisting of resistivity, conductivity, resonant frequency, and electromagnetic susceptibility.

15. (currently amended) The method claim 1 wherein said step of ~~periodically~~ heating is performed periodically and includes a step of measuring a period of time since a last heating cycle and, in response to a lapse of a predetermined time period, heating said portion of said corona electrode by flowing an electrical current therethrough.

16. (currently amended) The method according to claim 1 wherein said step of ~~periodically~~ heating is performed periodically and includes a step of measuring a time period of a current heating cycle and, in response to expiration of a predetermined period of time, terminating the current heating cycle by interrupting an electrical current flowing therethrough.

17. (original) The method according to claim 1 including the steps of terminating said step of producing prior to initiating said step of periodically heating and, upon completion of said step of periodically heating, reinitiating said step of producing said high-intensity electric field.

18. (currently amended) A method of operating a corona discharge device comprising the steps of:

applying a high voltage to a plurality of corona electrodes for producing a high-intensity electric field in an immediate vicinity of [[a]] each of said plurality of corona electrodes;

detecting an electrical characteristic of said corona electrodes indicative of ~~initiation~~ an oxidation of [[a]] said corona electrodes ~~electrode deoxidation cycle~~;

interrupting application of [[a]] said high voltage to at least a first group ~~a portion~~ of said corona electrodes so as to terminate said step of producing said high-intensity electric field with regard to ~~that portion of~~ said first group of corona electrodes;

applying a heating current to said first group ~~portion~~ of ~~said~~ corona electrodes sufficient to raise a temperature thereof resulting in at least partial elimination of an ~~impurity~~ oxide formed on ~~said portion of~~ said first group of corona electrodes; and

reapplying said high voltage to said first group ~~portion~~ of ~~said~~ corona electrodes so as to ~~continue producing~~ resume production of said high-intensity electric field ~~with regard to that portion of corona electrodes~~.

19. (currently amended) The method according to claim 18 wherein said plurality of corona electrodes are divided into a plurality of groups including said first group ~~said portions~~ and said step of applying said heating current is sequentially repeated with respect to each of said groups ~~portions~~.

20. (currently amended) The method according to claim [[18]] 19 wherein said repeated application of said heating current to each of said groups ~~portions~~ of ~~said~~ corona electrodes is completed for all of said plurality of corona electrodes prior to said step of reapplying said high voltage to any of said ~~portions of said~~ corona electrodes.

21. (currently amended) The method according to claim [[18]] 19 wherein said plurality of corona electrodes are divided into a plurality of said ~~portions~~ groups including said first group of corona electrodes and said steps of interrupting application of a high voltage,

applying said heating current, and reapplying said high voltage are performed serially for each of said ~~portions~~ groups of corona electrodes so that said high voltage is interrupted, and said heating current is applied, to a single group ~~portion~~ of said corona electrodes at any one time, the other ~~portions~~ groups continuing to have said high-voltage applied thereto.

22. (currently amended) A corona discharge device comprising:

a high voltage power supply connected to corona electrodes generating a high intensity electric field in an immediate vicinity of said corona electrodes; ~~and~~

a low voltage power supply connected to said corona electrodes for resistively heating said corona electrodes; and

control circuitry for alternatively applying said high voltage power supply and low voltage power supply to said corona electrodes.

23. (currently amended) The corona discharge device according to claim 22 wherein said corona electrodes include a surface material of a metal readily oxidized in an oxygen atmosphere in the presence of a said high intensity electric field and selected from the group consisting of silver, lead, zinc and cadmium.

24. (currently amended) The corona discharge device according to claim 22 wherein said low voltage power supply is configured to heat said corona electrodes to attain a temperature T sufficient for deoxidation of said corona electrodes and given by the equation

$$T > \Delta H^{o}_{rxn} / \Delta S^{o}_{rxn}$$

where ΔH^{o}_{rxn} is the standard state enthalpy (Dhorxn) and ΔS^{o}_{rxn} is the standard state entropy changes for the oxidation process of a surface material of said corona electrode.

25. (currently amended) A corona discharge device according to claim 22 further including a timer, said control circuitry responsive to said timer for periodically interrupting application of said high voltage power to said corona electrodes, applying said low voltage to said corona electrodes and, subsequently, resuming application of said high voltage power supply to said corona electrodes.

26. (original) The corona discharge device according to claim 22 wherein said control circuitry comprises a switch.

27. (currently amended) The corona discharge device according to claim 22 further comprising measurement circuitry configured to ~~provide an indication of~~ detect an electrical characteristic indicative of an oxidation of said corona electrodes, said control circuitry responsive to said electrical characteristic for applying said low voltage to said corona electrodes.

28. (original) The corona discharge device according to claim 27 wherein said measurement circuitry indicates an electrical resistance of said corona electrodes.

29. (currently amended) The corona discharge device according to claim 22 wherein said low voltage power supply is configured to supply a controlled magnitude of electric power dissipation in ~~to~~ said corona electrodes.

30. (original) The corona discharge device according to claim 22 wherein said low voltage power supply is configured to periodically accumulate and discharge a controlled amount of electromagnetic energy to said corona electrodes.

31. (original) The corona discharge device according to claim 22 wherein said low voltage power supply comprises a fly-back power converter.

32. (currently amended) A method of generating a corona discharge comprising the steps of:

generating a high intensity electric field in a vicinity of a corona electrode;

converting a portion of an initial corona electrode material of said corona electrode using a chemical reaction that decreases generation of a corona discharge by-product;

interrupting said step of generating said high intensity electric field in said vicinity of said corona electrode; and

heating the corona electrode to a temperature sufficient to substantially restore the converted part of the corona electrode material back to the initial corona electrode material.

33. (original) The method according to claim 32 wherein said corona discharge by-product comprises ozone.

34. (previously presented) The method according to claim 1 wherein said heating step includes a step of applying an electric current to said corona electrode to cause said corona electrode to attain said temperature sufficient to mitigate said undesirable effect.

35. (previously presented) The method according to claim 1 wherein said step of producing said high intensity electric field includes producing said high intensity electric field in an immediate vicinity of an ionizing edge of said corona electrode.

36. (previously presented) The method according to claim 1 wherein said step of producing said high intensity electric field includes producing said high intensity electric field in an immediate vicinity of respective ionizing edges of each of a plurality of corona electrodes so

as to generate an ionic wind and said step of heating includes heating at least a portion of each of said plurality of corona electrodes to mitigate formation of an oxide thereon.

37. (previously presented) The method according to claim 18 wherein said step of producing a high-intensity electric field in an immediate vicinity of a plurality of corona electrodes includes producing said high intensity electric field in an immediate vicinity of ionizing edges of said corona electrodes so as to generate an ionic wind.

38. (currently amended) A method of operating a corona discharge device comprising the steps of:

producing a high-intensity electric field in an immediate vicinity of a plurality of corona electrodes to thereby generate an ionic wind;

temporarily ~~reducing an intensity~~ suspending said production of said high-intensity electric field to suspend said generation of said ionic wind;

heating the corona electrodes to a temperature sufficient to mitigate an undesirable effect of an ~~impurity~~ oxide formed on said corona electrode while said generation of said ionic wind is suspended; and

resuming production of said high-intensity electric field in said immediate vicinity of said plurality of corona electrodes to thereby resume said generation of said ionic wind.